

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 RVI 9,8 a 1

1. Edition

En

PES 6 P 120 A 320 RS 419-1 RQ 750 PA 595

supersedes -

company: RVI

engine: MIDS 062045

130 kW (177 PS)

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 - 2,9$ mm (from BDC)
(2,75-2,95)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,0±0,1	16,3 - 16,6	0,5(0,9)			
250	5,8-6,0	1,7 - 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		①		Full-load speed regulation Setting point rev/min 3				④				Idle speed regulation Setting point rev/min 7				⑤				Torque control rev/min 11		③	
Control rod travel mm 2				Control rod travel mm 4		Control rod travel mm 5		rev/min 6				Control rod travel mm 8		Control rod travel mm 9		Control rod travel mm 10						Control rod travel mm 12	
1100		15,2-17,8		1100		16,5		9,0 4,0 900		750-755 775-785 0 -1,0		-		-		-		-		-		-	

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At 750-755 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		②		Control rod stop rev/min 3		③a		Fuel delivery characteristics rev/min 4		③b		Starting fuel delivery Idle speed rev/min 6		⑥	
cm ³ /-1000 strokes 2								cm ³ /-1000 strokes 5				cm ³ /1000 strokes/mm 7		Control rod travel mm	
700		163,0-166,0 (160,0-169,0)		-		-		-		-		-		-	

Checking values in brackets

2,82

Test Specifications

Distributor-type

Fuel-injection Pumps

En

46

WPP 001/4 Vol 3,6 a

1. Edition

VE 6/11 F 1800 L 19

0 460 416 002

Overflow temperature 45° C

Plunger lift of 1,0 mm related to outlet "A"

supersedes

Volvo

company:

TMD 40

engine:

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

0,2

mm

± 0,02 (0,04) mm

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1700	4,9-5,3 mft		
1.2 Supply-pump pressure	1700	6,7-7,3 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1500	70,5-71,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	---	---- cm ³ /1000 strokes		
1.4 Idle regulation	350	9,0-13,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min.70,0 cm ³ /1000 strokes		
1.6 Start	1900	39,0-45,5 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	---	---		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,6-2,6(1,4-2,8)	1700 (4,4-5,8)	1900 5,4-6,1(5,0-6,4)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	500 2,5-3,1	1700 (6,7-7,3)	
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)	1800 55-111(40-126)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2100-2200 1900 1800 1500 600	0 (38,5-46,5) 64,5-67,0 (63,45-68,05) (68,7-73,3) 55,5-58,5 (54,0-60,0)	
switch-off	1800	0	
Idle stop	420-480 350	0 /7,0-15,0)	
2.4 Solenoid	cut-in voltage min.10 V rated voltage 12 V		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	---
KF	5,9-6,1
MS	1,7-1,9
SVS	max.2,6
A	9,0-14,0
B	10,6-13,8

Observations

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Test Specifications

Distributor-type Fuel-injection Pumps

VE 6/11 F 1800 L 19-4

0 460 416 006

Overflow temperature 45° C

Plunger lift of 1,0 mm related to outlet "A"

supersedes

company:

Volvo

engine:

MD 60 A (B)

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,2 mm $\pm 0,02$ (0,04)

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	4,0-4,4 mm		
1.2 Supply-pump pressure	1500	6,0-6,5 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1000	43,0-44,0 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	350	9,0-13,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 70,0 cm ³ /1000 strokes		
1.6 Start	1950	27,0-33,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,4-2,4 (1,2-2,6)	1500 (3,5-4,9)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	500 2,5-3,0	1500 6,0-6,5
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111 (40-126)	1800 55-111 (40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2100-2200 2050 1950 1800 1000 600	0 max. 9,0 (26,0-34,0) 40,5-43,5 (39,7-44,3) (41,2-45,8) 30,5-33,5 (29,0-35,0)	
switch-off	1800	0	
Idle stop	420-480 350	0 (7,0-15,0)	
End stop	100 220	min. 65 max. 60	
2.4 Solenoid	cut-in voltage	10 V rated voltage 12 V	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	
KF	5,9 - 6,1
MS	1,7 - 1,9
SVS	max. 2,6
A	
B	

Observations

Test Specifications Fuel Injection Pumps and Governors

VDT-WPP 001/4 DAF 8,3 c

2. Edition

En

PE 6 MW 90/720 RS 6

RW 250/1200 MW 6

supersedes

4.75

company

D A F

engine

DH 825

Sliding-sleeve idle travel = 6.75 + 0.25 mm

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,0 - 2,1
(1,95-2,15)

mm (from BDC)

10,5mm

Control rod travel

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (compensating valve)
rev/min	mm	cm ³ /100 strokes	cm ³ /100 strokes	mm	cm ³ /100 strokes	mm
1	2	3	4	2	3	6
1000	9,5	7,34-7,54	0,35(0,6)			
250	(5,9 +0,2)	0,88-1,28	0,35(0,55)			
800	-	- - -	0,5 (0,7)			

Set uniform delivery according to the values in .

Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever	Control rod travel	Rotational speed	Degree of deflection of control lever	Control rod travel	Rotational speed		Rotational speed	Control rod travel
1	2	3	4	5	6	7	8	9
ca. 25 ^① (+1) ^②	min. 9,5	100-150	ca. 52 ^⑦ (+4) ^⑧	9,1-9,5	1200		100	20,5-21,5
	5,7	240-260		8,5	1240-1250		1000	9,4- 9,6
	with	250-260		4,3	1260-1320		800	9,6- 9,8
	contact			max. 1,0	1320-1380			
	max. 1,0	450-550		-	- - -			
							Switching point 150-200(125-225)	

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery		Full-load speed regulation	Variations in fuel delivery		Starting fuel delivery		Difference
Test oil temp. 40°C (104°F)					Idle		
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	cm ³ /1000 strokes
1	2	3	4	5	6	7	8
1000	73,4-75,4 (71,4-77,4)	1240-1250* (1235-1255)	800	72,3-76,3 (70,3-78,3)	100	min. 220	10,0
					250	5,7-6,1 (6,3-15,3)	2,0 (4,0)
					1260-1320	4,3mm RW	

Checking values in brackets

less control rod travel than in Column 2

5.82

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Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4

4. Edition

En

PES 8 P 120 A 321 RS242 RQV 250-1150 PA208DR

supersedes

company:

engine:

2.74

Berliet

V 835

Testing with T nozzles and fuel lines 8x2x1000

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,4+0,1

mm (from BDC)

Cyl. 5

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	15,4-16,2	0,7			
600	9	5,2 - 6,2				
	12	9,5 -11,0				
	15	16,0 -17,7				
200	9	4,5 - 5,5				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1170	15,0-18,2	-	-	-	ca. 12	100	6,1-8,0	1190	8,3
	1220	10,2-14,5					250	4,9-6,7		
	1300	1,8-11,0					420	2,0-3,9	1150	0
	1420	0					600	0,3-1,8	500	1,1-1,3
							710	0		

Torque control travel a = 1,2 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1150	144,0-146,0	1260; 1290-1300*	1000 750 500	139,0-142,0 124,0-128,0 91,0- 97,0	100 250	min. 90 13,0-21,0		

Change-over point
200-130 min⁻¹

Checking values in brackets

* 1 mm less control rod travel than col. 2

10.76

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Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 FIA 13,8 b

3. Edition

En

PE 6 P 120 A 720 RS 214 RQ 225/1100 PA 336 R

supersedes 8.80

company: Fiat

engine: 8210.12.275

Testing with T nozzles and fuel lines 8x2x1000 according to W 400/305

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(1,95-2,15)

Port closing at prestroke

2,00-2,10

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,2	19,4 - 19,8	0,4(0,8)			
225	7,9-8,1	6,8 - 7,4	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Control rod travel mm 2		Full-load speed regulation Setting point rev/min 3		Control rod travel mm 4		Test specifications Control rod travel mm 5		rev/min 6		Idle speed regulation Setting point rev/min 7		Control rod travel mm 8		Test specifications Control rod travel mm 9		rev/min 10		Torque control rev/min 11		Control rod travel mm 12	
600		15,6-16,4		500		16,0		9,2		1145-1160		225		8,0		100		min. 9,5		1100		10,2-10,3	
								4,0		1190-1220						225		7,9-8,1		600		10,2-10,4	
																375-415		=2,0					

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6		Control rod travel mm 7	
1100	194,0-198, (191,0-201,0)		500			100		min. 15 mm	

Checking values in brackets

2.81

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 Fiat 13,8 b 1

1. Edition

En

PE 6 P 120 A 720 RS 214 RQ 225/1100 PA 118 R

supersedes

company: Fiat
engine: 8210.02

Testing with T nozzles and fuel lines 8x2x1000 according to W 400/305

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,95-2,15)
2,00-2,10 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,0	22,6-23,2	0,8			
600	9,0 15,0	10,4-11,9 28,6-31,0				
200	9,0	8,7- 9,9				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider FRG check		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Test specifications Control rod travel mm 5	rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	15,6-16,4	600	16,0	10,1	1145-1160	225	6,0	100	min. 7,5		
1100	15,6-16,0			4,0	1195-1225			225	5,9-6,1		
1250	0 - 1							320-380	2,0		
								450	0 - 1		

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristic		Starting fuel delivery Idle speed	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
100	195,0-197,0 (193,0-199,0)					

Checking values in brackets

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 PEN 6,0 c

3. Edition

En

PES 6 MW 100/320 RS 1004
RSV 325...1400 MW 8/308

supersedes 4.80
company Volvo-Penta
engine TAMD 60B

1 - 5 - 3 - 6 - 2 - 4 = 0 -60-120-180-240-300 $\pm 0,5$ (0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,80-2,90$ mm (from BDC) RW 10,5 mm
 $2,75-2,95$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	10,6 $\pm 0,1$	8,1 - 8,3	0,35(0,6)			
325	4,7 $\pm 0,2$	0,95-1,35	0,35(0,55)			
1400		C, Sp. 4-5	0,5 (0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed			4 Lower rated speed Control-lever deflection in degrees 7			3 Torque control Control rod travel mm 11	
Control rod travel mm 2	Control rod travel mm rev/min 3		4	5	6	rev/min 8	Control rod travel mm 9		rev/min 10	
loose	800	0,3-1,0				13-21	325	4,3	1400	10,6-10,7
							325	4,7-4,9	500	10,6-10,8
60-68	1440-1450=9,6						490-550	= 2,0	375	11,6-12,6
2a	1460-1490=4,0									
	1600=0,3-1,7									

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F) rev/min 1		6 Rotational-speed limit Note: changed to ...) rev/min 3		3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5 Idle stop Control rod travel mm 9	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7		rev/min 8	
1000	81,0-83,0 (79,0-85,0)	1440-1450*	1400	85,5-89,5 (84,0-90,0)		100 325	min.130 9,5-13,5 (7,0-16,0)	325	4,8

Checking values in brackets

* 1 mm less control rod travel than col. 2

5.82

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Test Specifications Fuel Injection Pumps ①A and Governors

40

WPP 001/4 PEN 6,0 d

3. Edition

En

PES 6 MW 100/320 RS 1004 Z
RSV 325... 1400 MW 2 / 308 R
Komb.Nr. 0 403 476 008

supersedes
company
engine

5.81
Volvo-Penta
TAMD 60 B

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\begin{matrix} 2,80-2,90 \\ (2,75-2,95) \end{matrix}$ mm (from BDC) $RW = \dots - 12,0 \text{ mm}$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,3+0,2	11,2 - 11,4	0,35(0,6)			
325	4,4-4,6	0,95 - 1,35	0,35(0,55)			
1400			0,5 (0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3 - 1,0				ca. 20	325	3,9-4,1	1400	12,3-12,5
	x	4,0					100	min. 19,0	1000	12,3-12,5
ca. 57		1440-1450 = 11,4 1505-1535 = 4,0 1650 = 0,3-1,7					325	4,4-4,6		
②a							395-455	= 2,0	350	13,8-14,2

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min				Idle		Control rod travel mm	
rev/min 1	cm ³ /1000 strokes 2	3	4	cm ³ /1000 strokes 5	6	rev/min 7	cm ³ /1000 strokes 8	rev/min 9	
1000	112,0-114,0 (110,0-116,0)	1440-1450	1400	109,0-113,0 (107,0-115,0)	100 325	min. 120 9,5-13,5 (7,0-16,0)		325	4,5

Checking values in brackets

* 1 mm less control rod travel than col. 2

5,82

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Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4

1. Edition

En

PE 6 P 100 A 321 RS271 EP/RSV 250-1200 P 1/375DR

supersedes -

company

Berliet

engine

MJDS 06.20.30

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 + 0,1

mm (from BDC)

(+0,15)
(-0,05)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,4 - 10,1	0,5			
600	9	2,0 - 3,0				
	15	13,6 - 15,1				
200	9	0,6 - 1,5				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca .63	1200	16,0	without auxiliary spring			ca .24	250	8,5	1180	0
	1250	10,3					100	19 - 21		
	1270	7,0	with auxiliary spring				250	8,2-0,8	400	1,8-2,0
	1250	8,8-11,2					400	4,4-6,5		
	1300	3,8- 6,0					650	0 - 1		
2a	1420	0,3- 1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		5 Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to) rev/min							
rev/min 1	cm ³ /1000 strokes 2	3	4	cm ³ /1000 strokes 5	6	cm ³ /1000 strokes 7	8	rev/min 9	Control rod travel mm 9
LDA 1200	0,6 bar 113,0-115,0	1220	LDA 800	0,6 bar 139,0-143,0	100				
			LDA 500	0,26 bar 102,0-106,0					

Checking values in brackets

* 1 mm less control rod travel than col. 2

5.76

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Test Specifications Fuel Injection Pumps 1A and Governors

40

WPP 001/4 VOL 6,0 p
2. Edition

En

PES 6 MW 100/320 RS 1004
RSV 325-750 MW 4/311

supersedes 6.81
company Volvo
engine TD 60 B 6
140 kW(190 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,80-2,90
(2,75-2,95) mm (from BDC) RW = 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,9+0,1	8,4 - 8,6	0,35(0,6)			
325	4,6-4,8	0,95-1,35	0,35(0,55)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3 - 1,0				ca .20	325	4,2	375	12,2-
	x =						325	4,6-4,8	470	12,8
ca .39	750-760 = 9,9						355-415 = 2,0			10,9-
2a	760-790 = 4,0									11,0
	930 = 0,3-1,7									

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limitat.		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)				Idle			
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
700	84,0-86,0 (82,0-88,0)	750-760 *				100	min. 130		

Checking values in brackets

* 1 mm less control rod travel than col. 2

5.82

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Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 PEN 6,0 b

2. Edition

En

PES 6 MW 100/320 RS 1004
EP/RSV 325 - 1400 MW 2 / 308 R

supersedes
company
engine

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,80 - 2,90$ mm (from BDC) RW = 9,0 - 12,0 mm
(2,75 - 2,95)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	10,6±0,2	8,8 - 9,0	0,35(0,6)			
325	4,5 - 5,0	0,95-1,35	0,35(0,55)			
1400	- - - -	C, 4-5	0,5 (0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0				18-26	325	4,4		± 0,1
		x = 4,0					100	min. 19	1400	10,7
53-61		1440-1450 = 9,7					325	4,8-5,0	500	10,7
②a		1505-1535 = 4,0					395-455	= 2,0	350	
		1650=0,3-1,7							12,0	- 12,5

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min				Idle			
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9	
1000	88,0-90,0 (86,0-92,0)	1440-1450*	1400	91,0-95,0 (89,0-97,0)	100	min. 120			
					325	9,5-13,5 (7,0-16,0)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

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5.82

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 DAF 11,1 c

En

2. Edition

PE 6 P 100/320 RS 68

RQ 200/950 PA 188 R

supersedes 9.9.71
company: D A F
engine:

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,2 - 3,3 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,4 - 12,9	0,5			
600	9	5,2 - 6,2				
600	12	11,4 - 12,8				
600	15	17,3 - 18,5				
200	9	3,4 - 4,5				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5 rev/min 6		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 9 rev/min 10		Torque control rev/min 11 Control rod travel mm 12	
450	15,7-16,3	450	16	970	15,6-16,0	430	0	80	6,5-8,1	-	-
				1000	7,5-13,3			150	5,0-7,0		
				1030	0 - 8,3			250	1,4-3,7		
				1070	0			330	0		

Torque-control travel
on flyweight assembly dimension a = mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6		Control rod travel mm 7	
940	103,0-105,0	975							

Checking values in brackets

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 FIAT 13,8 a 2

1. Edition

En

PE 6 P 120 A 720 RS 167

RQ 300/1100 PA 336 R

supersedes -

company: Fiat

engine: 8210.12.275
154,5 kW(210 PS)1 - 5 - 3 - 6 - 2 - 4
0 -60 -120-180-240-300

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,95-2,15) mm (from BDC) RW 9,0 - 12,0 mm
2,00-2,10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,3	17,6 - 18,0	0,5/0,9			
225	+ 0,1 7,5-7,6	1,7 - 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation		Idle speed regulation		Torque control					
①		④		⑤		③					
Setting point	Test specifications	Setting point	Test specifications	Setting point	Test specifications	Setting point	Test specifications				
Control rod travel mm	Control rod travel mm	Control rod travel mm	Control rod travel mm	Control rod travel mm	Control rod travel mm	Control rod travel mm	Control rod travel mm				
rev/min	rev/min	rev/min	rev/min	rev/min	rev/min	rev/min	rev/min				
1	2	3	4	5	6	7	8	9	10	11	12
550	15,6-16,4	550	16,0	9,3	1145-1160	225	5,3	100	min.6,8	1100	10,3-10,4
				4,0	1190-1220			225	5,2-5,4	550	10,3-10,5
								315-355	=2,0		
1300	0 - 1										

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min	cm ³ /-1000 strokes	rev/min	rev/min	cm ³ /-1000 strokes	rev/min	cm ³ /1000 strokes/ mm
1	2	3	4	5	6	7
1100	176,0-180,0 (173,0-183,0)				200	250 - 270
					225	5,3

Checking values in brackets

10.80

B2

62

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28

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 RVI 8,8 a

1. Edition

En

PE 6 P 120 A 320 RS 436 RQ 750 PA 595

supersedes --

company:

RVI

engine:

MID (S) 062 030
90 kW (122PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{2,8-2,9}
(2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,0+0,1	17,2 - 17,6	0,5(0,9)			
250	5,4-5,6	1,5 - 2,1	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 10		Torque control rev/min 11	
	Control rod travel mm 2		Control rod travel mm 4		rev/min 6		Control rod travel mm 8		Control rod travel mm 10		Control rod travel mm 12
-	-	-	-	9,0 4,0	750-755 775-785	-	-	-	-	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

750-755 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
	cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		Control rod travel mm 7
700	172,0-176,0 (169,0-179,0)					100	19,5-21,0mmRW

Checking values in brackets

4.81

B5

65

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Test Specifications Fuel Injection Pumps ① and Governors

PES 6 MW 100/320 RS 1004

RQV 350...1050 MW 10/2

1 - 5 - 3 - 6 - 2 - 4 = 0 - 60-120-180-240-300 $\pm 0,5^\circ$ (0,75°)

supersedes

5.81

company:

Volvo

engine:

TD 60

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,80-2,90
(2,75-2,95)

mm (from BDC)

RV 9 - 12 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	10,9-11,1	8,85 - 9,05	0,35(0,6)			
350	4,7-4,9	0,95 - 1,35	0,35(0,55)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 46	1050 1350	15,2-17,8 0 - 1,0				8-16	100 350 395-455=2,0	min. 6,3 4,7-4,9	1150-1180 = 8,8 500 350	1180 2,3-2,6 1,3-1,4
ca. 42	9,9 4,0	1090-1100 1140-1170				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
800	88,5-90,5 (86,5-92,5)	1090-1100*			100 350	min. 120,0 9,5-13,5 (7,0-16,0) 100-280 (80-300)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 11,1 r 1

1. Edition

En

Testoil-ISO 4113

PES 6 P 110 A 720 LS 375

ROV 250-1100 PA 580

supersedes

company: MAN

engine: D2566 MTE

206 kW (280 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $3,0 - 3,1$ mm (from BDC) Port closing mark cyl. 6 :
 (2,95 - 3,15)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	12,1 +0,1	14,7 - 14,9	0,4(0,8)			
250	6,8-7,0	1,0 - 1,6	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1100 1350	15,2-17,8 0 - 1,0				ca. 11	100 250	min. 8,5 6,8-7,0	250 500 800 1100	0,6-1,2 2,6-3,2 4,8-5,4 8,6
ca. 47	11,1 4,0	1140-1150 1200-1230				③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1100	147,0-149,0 (144,0-152,0)	1140-1150*	-	-	100 250	225,0-245,0 10,0-16,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

En

PE 6 P 100 A 320 LS 818 RQV 350-1250 PA378R

supersedes -

company: Daimler-Benz

engine: OM 401

** Set at the reduced-delivery stop.

6 - 3 - 5 - 2 - 4 - 1 + 0,50

0 -45 -120-165-240-285° (\pm 0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,4 - 3,5$ mm (from BDC) Cyl. 6
(3,35-3,55)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1230	10,9 +0,1	10,40-10,60	0,3(0,6)			
350	7,5-7,7	1,30 - 1,90	0,3(0,5)			
1230**	- - -	C, 4 - 5	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1250 1500	15,2-17,8 0 - 1	-	-	-	ca. 13	100 350 680-740 = 2,0	min. 9,1 7,5-7,7	350 800 1295	1,5-1,7 4,5-4,8 8,8
ca. 64	9,9 4,0	1280-1290 1360-1390				③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1230	104,0-106,0 (102,0-108,0)	1280-1290*	1230	**72,0-74,0 (70,0-76,0)	100 1375	120-140 dispersion max. 4(6)		
						100-270 (80-290)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

PES 6 MW 100/320 RS 1004

RQV 300...1400 MW 27

Komb.Nr. 0 403 446 119

1-5-3-6-2-4 = 0-60-120-180-240-300 \pm 0,50° (0,75°)

supersedes

5.81

company:

Volvo

engine:

TD 60 B

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,80-2,90}{(2,75-2,95)}$ mm (from BDC) RW = 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	10,0+0,1	7,85 - 8,05	0,35(0,6)			
300	4,7-4,9	0,95 - 1,35	0,35(0,55)			
1400			0,5 (0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1400 1650	15,2-17,8 0,0- 1,0				ca. 9	100 300 390-450 = 2,0	min. 6,3 4,7-4,9		
ca. 64	9,0 4,0	1440-1450 1530-1560				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2)		Rotational-speed limitation intermediate speed (2b) (4a)	Fuel delivery characteristics (5a) high idle speed (5b)		Starting fuel delivery idle switching point (6)		Torque-control travel (5) Control rod travel mm	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
1000	78,5-80,5 (76,5-82,5)	1440-1450*	1400	82,0-86,0 (80,0-88,0)	100 300	min. 120,0 9,5-13,5 (7,0-16,0)		
					100-230 (80-250)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 Vol 6,0a
3, Edition

En

PES 6 MW 100/320 RS 1004 Z
RQV 300-1150 MW 8/2 R
Komb. Nr. 0 403 446 120

supersedes 6.81
company: Volvo
engine: D 60

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,80-2,90$ mm (from BDC) RW 9,0 - 12,0 mm
(2,75-2,95)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	9,7+0,1	7,35-7,55	0,35(0,6)			
300	5,2-5,4	0,95-1,35	0,35(0,55)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1150 1400	15,2-17,8 0 - 1,0				ca. 11	100 300 370-430=2,0	min. 7,0 5,0-5,2		
ca. 47	8,7 4,0	1190-1200 1210-1240				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
800	73,5-75,5 (71,5-77,5)	1190-1200*			100	min. 120		

Checking values in brackets

* 1 mm less control rod travel than col. 2

5.82

BOSCH

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Test Specifications Fuel Injection Pumps ① and Governors

En

PES 6 MW 100/320 RS 1004
RQV 300...1400 MW 7 0 420 083 003

supersedes 5.81
company: Volvo
engine: TD 60B

1 - 5 - 3 - 6 - 2 - 4 = 0 -60 -120-180-240-300 $\pm 0,5^\circ (0,75^\circ)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

RW = 10,5 mm

Port closing at prestroke

2,80-2,90
(2,75-2,95)

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9,8+0,1	7,55-7,75	0,35(0,6)			
300	4,7-4,9	0,95-1,35	0,35(0,55)			
1400		C, Sp. -5	0,5(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
67	1400 1650	15,2-17,8 0,0- 1,0				5-13	100 300	min.6,3 4,7-4,9	1440-1450 = 8,2 390-450 = 2,6	
63+4	8,8 4,0	1440-1450 1530-1560				3a	390-450=2,0		300	1,3-1,4

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1000	75,5-77,5 (73,5-79,5)	1440-1450*	1400	79,0-83,0 (77,0-85,0)	100 300	min.120 9,5-13,5 (7,0-16,0)		
					100-230(80-250)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

PES 6 MW 100/320 RS 1004
RQV 300 ... 1250 MW 16, MW 8, MW 8-2
1 - 5 - 3 - 6 - 2 - 4 = 0 - 60 - 120-180-240-300 + 0,5°
(0,75°)

supersedes 5.81
company: Volvo
engine: TD 60

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\overset{2,80-2,90}{(2,75-2,95)}$ mm (from BDC) RW 9-12 mm

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	10,2+0,1	7,95-8,15	0,35(0,6)			
300	4,6-4,8	0,95-1,35	0,35(0,55)			
1250			0,5(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 49	1250 1500	15,2-17,8 0,0- 1,0				8-16	100 300	min. 6,5 4,6-4,8	1280-1300 = 8,45 500	1300 2,5-2,7
ca. 45	9,3 4,0	1290-1300 1345-1375				③a	330-390	=2,0	300	1,4-1,5

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery idle switching point		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1000	79,5-81,5 (77,5-83,5)	1290-1300*	1250	80,0-84,0 (77,5-85,5)	100 300	min. 120 9,5-13,5 (7,0-16,0)		

Checking values in brackets

* 1 mm less control rod travel than col. 2
5.82

Test Specifications

Fuel Injection Pumps ①

and Governors

En

PES 6 MW 100/320 RS 1004
RQV 350-1150 MW 10
Komb.Nr. 0 403 446 115

supersedes 5.81
company: Volvo
engine: TD 60 B

1 - 5 - 3 - 6 - 2 - 4 = 0 -60-120-180-240-300 $\pm 0,5^\circ$ (0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\overset{2,80-2,90}{(2,75-2,95)}$ mm (from BDC) RW = 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	10,9+0,1	8,85-9,05	0,35(0,6)			
350	4,7-4,9	0,95-1,35	0,35(0,55)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	①a	Degree of deflection of control lever 4	rev/min mm 6	④	Degree of deflection of control lever 7	rev/min mm 9	③	①
48	1050 1400	15,2-17,8 0,0- 1,0					8 - 16	100 350 395-455=2,0	min.6,3 4,7-4,9 =2,0	1125- 1160 =8,45 1090- 1100 =7,75 350 1,3-1,4
40-48	9,9 4,0	1190-1200 1260-1290					③a			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
800	88,5-90,5 (86,5-92,5)	1190-1200*			100 350 100-	min.120 9,5-13,5 (7,0-16,0) 280(80-300)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 PER 5,8 b 1

1. Edition

En

VE 6/12 F 1300 L 21-1 Overflow temperature 45° C
 0 460 426 004
 Plunger lift of 1,0 mm related to outlet "A"

supersedes
 company: Perkins
 engine: T 6.354.4

Nozzle-and-holder assembly 1 688 901 020

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm \pm 0,02 (0,04)

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	600	3,6-4,2 mm	0,67	
1.2 Supply-pump pressure	600	3,6-4,6 bar (kgf/cm ²)	0,67	
1.3 Full-load delivery with charge-air pressure	600	79,0-81,0 cm ³ /1000 strokes	0	2,5(3,0)
Full-load delivery without charge-air pressure	1000	90,0-91,0 cm ³ /1000 strokes	0,67	
1.4 Idle regulation	270	8,0-12,0 cm ³ /1000 strokes	0	2,5(3,0)
1.5 Full-speed regulation	100	min. 100,0 cm ³ /1000 strokes	0	
1.6 Start	1480	42,0-50,0 cm ³ /1000 strokes	0,67	
1.7 Load-dependent port-closing	--	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device LDA=0,67bar	n = rev/min mm	400 1,6-2,6(1,4-2,8)	600 (3,2-4,6)	800 3,6-4,5(3,35-4,75)
2.2 Supply pump LDA=0,67bar	n = rev/min bar (kgf/cm ²)	400 2,8-3,8		800 4,3-5,3
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)		1300 55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1550 1480 1300 1000 * 600 600	3,0-11,0 (3,0-11,0) (42,0-50,0) 80,5-83,5 (79,7-84,3) (88,2-92,8) 82,0-84,0 (80,0-86,0) (77,0-83,0)	0,67 0,67 0,67 0,67 0,27 0
switch-off mech.	500	0	
Idle stop	330-380 270	0 (6,0-14,0)	
End stop	100 190	min. 100 max. 80	
2.4 Solenoid	cut-in voltage		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	
KF	5,2-5,4
MS	1,7-1,9
SVS	max. 3,9
A	2,6-7,6
B	10,4-15,6

Observations

* LDA-stroke 4,0 mm
 USE adjusting nut
 (46) to correct.

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 Sof 2,5 h

1. Edition

En

VE 4/9 F 2200 R 24-1

Overflow temperature 45° C

0 460 494 111

supersedes

company:

engine:

Sofim

8/44/65/200

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm \pm 0,02(0,04) mm

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	2100	8,3-8,7 mm		
1.2 Supply-pump pressure	2100	7,0-7,6 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	2100	30,5-31,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	350	6,0-10,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 30,0 cm ³ /1000 strokes		
1.6 Start	2400	21,0-27,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1800	- -		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	400 2,0-3,0(1,8-3,2)	1200 4,9-5,5(4,5-5,9)	2100 (7,8-9,2)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,9-3,5		2200 7,3-7,9
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)		2200 55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2500 2400 2200 2100 1200 600	max. 6,0 (20,0-28,0) 29,8-31,8 (28,5-33,1) (28,7-33,3) 34,5-37,5 (33,7-38,3) 25,0-29,0 (24,0-30,0)	
switch-off	2200	0	
Idle stop	410-530 350	0 (4,0-12,0)	
End stop	400 500	min. 28 max. 32	
2.4 Solenoid	cut-in voltage 10 V rated voltage 12 V		

3. Dimensions

Designation	for assembly and adjustment mm
K	
KF	5,4-5,6
MS	1,7-1,9
SVS	max. 2,7
*FH	1,8-2,4
A	
B	
Observations	
* operating stroke (cold-start accel.)	

Test Specifications

Distributor-type

Fuel-injection Pumps

En

VE 4/9 F 2200 R 24
0 460 494 006

Overflow temperature 45° C

supersedes
company:
engine:

Sofim
8/44.65.201

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm \pm 0,02 (0,04)

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	2100	8,3-8,7 mm		
1.2 Supply-pump pressure	2100	7,0-7,6 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	2100	30,5-31,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	350	6,0-10,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 30,0 cm ³ /1000 strokes		
1.6 Start	2400	21,0-27,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1200	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	400 2,0-3,0(1,8-3,2)	1200 4,9-5,5(4,5-5,9)	2100 (7,8-9,2)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,9-3,5		2200 7,3-7,9
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)		2200 55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2500 2400 2200 2100 1200 600	max. 6,0 (20,0-28,0) 29,8-31,8 (28,5-33,1) (28,7-33,3) 34,5-37,5 (33,7-38,3) 25,0-29,0 (24,0-30,0)	
switch-off	2200	0	
Idle stop	410-530 350	0 (4,0-12,0)	
2.4 Solenoid	cut-in voltage 10 V rated voltage 12 V		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	--
KF	5,7-5,9
MS	0,9-1,1
SVS	max. 2,6
*FH	1,8-2,4
A	5,8-10,8
B	10,4-15,6

Observations

* operating stroke
(cold-start accel.)

Test Specifications Distributor-type Fuel-injection Pumps

En

VE 4/9 F 1950 R 22-6

Overflow temperature 45° C

 supersedes
company:
engine:

 Sofim
8140.61.230

0 460 494 110

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm \pm 0,02 (0,04)

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1800	7,4-7,8 mm		
1.2 Supply-pump pressure	1800	6,2-6,8 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1950	33,5-34,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	350	6,0-10,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min.55,0 cm ³ /1000 strokes		
1.6 Start	2150	14,0-20,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	-	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	400 1,9-2,7(1,6-3,0)	1100 4,9-5,5(4,5-5,9)	1800 (5,9-8,3)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,9-3,5	1100 4,6-5,2	
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)	1950 55-111(40-126)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2250 2150 1950 1100 600	max. 10,0 (13,0-21,0) (31,7-36,3) 37,7-40,3 (36,7-41,3) 30,0-33,0 (28,5-34,5)	
switch-off	1950	0	
Idle stop	500 350	max. 5,0 (4,0-12,0)	
2.4 Solenoid	cut-in voltage 10 V rated voltage 12 V		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	
KF	5,4-5,6
MS	1,7-1,9
SVS	max. 2,7
A	
B	

Observations

BOSCH

 Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
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Test Specifications

Distributor-type

Fuel-injection Pumps

VE 4/9 F 2100 R 22-1

Overflow temperature 45° C

supersedes

company:

engine:

Sofim

8.140.61.200

0 460 494 022

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm \pm 0,02 (0,04)

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1800	7,4-7,8 mm		
1.2 Supply-pump pressure	1800	6,3-6,9 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1500	38,5-39,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	350	8,0-12,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 55,0 cm ³ /1000 strokes		
1.6 Start	2260	21,0-27,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1800	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	400 1,8-2,8(1,6-3,0)	1800 (6,9-8,3)	2100 8,2-9,2(8,0-9,4)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,9-3,5	2100 6,9-7,5	
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)	2100 55-111(40-126)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)	3. Dimensions for assembly and adjustment mm
End stop	2440-2490 2400 2260 2100 1500 1000 600	0 max. 5,0 (20,0-28,0) 34,0-37,0 (33,2-37,8) (36,7-41,3) 38,0-41,0 (37,2-41,8) 31,0-34,0 (29,5-35,5)		K KF 5,2-5,4 MS 1,7-1,9 SVS max. 2,8 *FH 1,8-2,4
switch-off	2100	0		A 5,8-10,8 B 10,4-15,6
Idle stop	400-500 450 350	0 max. 3,3 (6,0-14,0)		Observations *operating stroke (cold-start accel.)
2.4 Solenoid	cut-in voltage	min. 10 V rated voltage 12 V		

BOSCH

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
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Test Specifications

Distributor-type

Fuel-injection Pumps

En

VE 4/9 F 2100 R 22-2

Overflow temperature 45° C

0 460 494 023

supersedes

company:

Sofim

engine:

8140.61.200

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment

Pre-stroke setting 0,3 mm \pm 0,02 (0,04)

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1800	7,4-7,8 mm		
1.2 Supply-pump pressure	1800	6,3-6,9 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1500	38,5-39,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	-	---- cm ³ /1000 strokes		
1.4 Idle regulation	350	8,0-12,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 55,0 cm ³ /1000 strokes		
1.6 Start	2260	21,0-27,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1800	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	400 1,8-2,8(1,6-3,0)	1800 (6,9-8,3)	2100 8,2-9,2(8,0-9,4)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,9-3,5		2100 6,9-7,5
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)		2100 55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2440-2490 2400 2260 2100 1500 1000 600	0 max. 5,0 (20,0-28,0) 34,0-37,0 (33,2-37,8) (36,7-41,3) 38,0-41,0 (37,2-41,8) 31,0-34,0 (29,5-35,5)	
switch-off	2100	0	
Idle stop	400-500 450 350	0 max. 3,3 (6,0-14,0)	
2.4 Solenoid	cut-in voltage 10 V rated voltage 12 V		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	
KF	5,2-5,4
MS	1,7-1,9
SVS	max. 2,8
*FH	1,8-2,4
A	5,8-10,8
B	10,4-15,6

Observations

* operating stroke
(cold-start accel.)

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 Sof 2,5 a

1. Edition

En

VE 4/0 F 2100 R 22

Overflow temperature 45° C

0 460 494 004

supersedes

Sofim

company:

engine:

8140.61.200

All test specifications are valid only for Bosch Fuel-Injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm \pm 0,02 (0,04)

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1800	7,4-7,8 mm		
1.2 Supply-pump pressure	1800	6,3-6,9 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1500	38,5-39,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	350	8,0-12,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 55,0 cm ³ /1000 strokes		
1.6 Start	2260	21,0-27,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1800	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	400 1,8-2,8(1,6-3,0)	1800 (6,9-8,3)	2100 8,2-9,2(8,0-9,4)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,9-3,5		2100 6,9-7,5
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)		2100 55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2440-2490 2400 2260 2100 1500 1000 600	0 max. 5,0 (20,0-28,0) 34,0-37,0 (33,2-37,8) (36,7-41,3) 38,0-41,0 (37,2-41,8) 31,0-34,0 (29,5-35,5)	
switch-off	2100	0	
Idle stop	400-500 450 350	0 max. 3,3 (6,0-14,0)	
2.4 Solenoid	cut-in voltage min. 10 V rated voltage 12 V		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	---
KF	5,2-5,4
MS	1,7-1,9
SVS	max. 2,8
*FH	1,8-2,4
A	5,8-10,8
B	10,4-15,6

Observations

*operating stroke
(cold-start accel.)



Test Specifications

Distributor-type Fuel-injection Pumps

46

WPP 001/4 Sof 2,5g

1. Edition

En

VE 4/9 F 2100 R 22-5
0 460 494 109

Overflow temperature 45° C

supersedes

company:

Sof im

engine:

8140.61.200

All test specifications are valid only for Bosch Fuel-Injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm \pm 0,02 (0,04)

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1800	7,4-7,8 mm		
1.2 Supply-pump pressure	1800	6,3-6,9 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	2000	37,5-38,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	370	8,0-12,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 55,0 cm ³ /1000 strokes		
1.6 Start	2350	19,0-25,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1800	---		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	400 1,8-2,8(1,6-3,0)	1800 (5,9-8,3)	2100 8,3-9,3(8,1-9,5)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,9-3,5		2100 6,9-7,5
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)		2100 55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2500 2350 2100 2000 1100 600	max. 4,5 (18,0-26,0) 36,7-39,3 (35,7-40,3) (35,7-40,3) 43,5-46,5 (42,7-47,3) 35,3-35,8 (33,8-39,8)	
switch-off	2100	0	
Idle stop	500 370	max. 3,0 (6,0-14,0)	
2.4 Solenoid	cut-in voltage	min. 10 V	
		rated voltage 12 V	

3. Dimensions

Designation	for assembly and adjustment mm
K	
KF	5,4-5,6
MS	1,7-1,9
SVS	max. 2,7
A	
B	
Observations	

Test Specifications

Fuel Injection Pumps ②

and Governors

WPP 001/4 FIA 5,5 a

4. Edition

En

PES 6 MW 80/720 RS 1015
RQ 300/1600 MW 24
Komb.Nr. 0 403 446 118

supersedes 8.81
company: Fiat
engine: 8060.24
118 kW(160 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,10-2,20$ mm (from BDC) RW = 10,5
(2,05-2,25)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	11,7+0,1	5,95-6,15	0,35(0,6)			
300	8,1-8,3	1,05-1,45	0,35(0,55)			
1600			0,5(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point ④				Idle speed regulation Setting point ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
700	15,6-16,4	700	16,0	10,7	1645-1660	300	8,2	100	min.9,0		
1900	0,0-1,0			4,0	1750-1780			300 480	8,1-8,3 max.3,5		

Torque-control travel
on flyweight assembly dimension a = mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
1000	59,5-61,5 (57,5-63,5)		1600	68,5-72,5 (66,5-74,5)	100	19,0-21,0 min. 110,0
					300	10,5-14,5 (8,0-17,0)

Checking values in brackets

5.82

Test Specifications Fuel Injection Pumps ② and Governors

PE 6 P 130 A 720 RS 300

RQ 750 PA 426 R

supersedes

company:

Jenbacher Werke

engine:

C 120 S

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{2,5-2,6} (2,45-2,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,0+0,1	24,0-24,4	0,5(0,8)			
300	6,1-6,3	1,9 2,5	0,8			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5 rev/min 6		Idle speed regulation Setting point rev/min 7 Control rod travel mm 8		Test specifications rev/min 9 Control rod travel mm 10		Torque control rev/min 11 Control rod travel mm 12	
-	-	-	-	11,0 4,0	750-755 775-785	-	-	-	-	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1 cm ³ /1000 strokes 2		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4 cm ³ /1000 strokes 5		Starting fuel delivery Idle speed rev/min 6 cm ³ /1000 strokes 7	
700	240,0-244,0 (237,0-247,0)	750 - 755*	-	-	-	100	19,5-21 mm RW

Checking values in brackets

Test Specifications

Distributor-type Fuel-injection Pumps

WPP 001/4 IHC 6,6 d

1. Edition

En

VE 6/12 F 1250 R 23-2; P Overflow temperature 45° C

0 460 426 014; 015 P

Plunger lift of 1,0 mm related to outlet "A"

Nozzle-and-holder assembly 1 688 901 020

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

supersedes

company:

IHC

engine:

DT 402/953 GD

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1000	4,0-4,4 mm	0,67	
1.2 Supply-pump pressure	1000	5,5-6,1 bar (kgf/cm ²)	0,67	
1.3 Full-load delivery with charge-air pressure	500	73,0-77,0 cm ³ /1000 strokes	0	2,5(3,0)
Full-load delivery without charge-air pressure	900	98,5-99,5 cm ³ /1000 strokes	0,67	
1.4 Idle regulation	450	20,0-26,0 cm ³ /1000 strokes	0	2,5(3,0)
1.5 Full-speed regulation	100	min.100,0 cm ³ /1000 strokes	0	
1.6 Start	1300	41,0-49,0 cm ³ /1000 strokes	0,67	
1.7 Load-dependent port-closing	--	---		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	500	1000
LDA=0,67 bar	mm	0,9-1,7(0,6-2,0)	(3,5-4,9)
2.2 Supply pump	n = rev/min	400	1250
LDA=0,67 bar	bar (kgf/cm ²)	3,5-4,1	6,6-7,2
Overflow delivery	n = rev/min	500	1250
	cm ³ /10 s	55-111(40-126)	55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1320-1370	0	0,67
	1300	(41,0-49,0)	0,67
	1230	90,0-93,0 (89,2-93,8)	0,67
	900	80,0-83,0 (79,2-83,8)	0
	900	(96,7-101,3)	0,67
	*500	83,5-86,5 (82,0-88,0)	0,26
	500	(72,0-78,0)	0
switch-off	1250	0	
Idle stop	480-550	0	
	450	(19,0-27,0)	
End stop	100-220	min.110	
	300	max. 81,5	
2.4 Solenoid	cut-in voltage	10 V	
	rated voltage	12 V	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,4-5,6
MS	1,4-1,6
SVS	3,3-6,0
A	
B	

Observations

* LDA-stroke 4,5 mm
Use adjusting nut
(46) to correct.

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 SCA 11,0 i 1

1. Edition

En

PE 6 P 100 / 720 RS 203 , Y EP/RSV 350-1100 P 1/310

Port-closing test with/without ROBO diaphragm

supersedes 11,0 i (7.71)

company Scania

engine D 11 A

**

In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,6 + 0,1 = 203$ mm (from BDC) ; $2,4+0,1= 203Y-$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,6 - 12,1	0,5			2,5 ± 0,1** (ma.2,2-2,9)
600	9	3,7 - 4,9				
	12	9,5 - 10,9				
	15	15,0 - 16,8				
200	9	2,4 - 3,4				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca.67	1100	16,0	without auxiliary spring			ca.31	350	6,0	max.	
	1150	11,7					100	19 - 21		
	1200	6,0					350	5,7-6,3		
	1150	10,4-12,5	with auxiliary spring				400	3,2-4,7		
②a	1200	4,4- 7,8					500	0 - 1		
	1350	0,3- 1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1100	159,0-161,0	1120		600	154,0-158,0	100	190-240	350	6,0
				1200	40,0- 44,0	225	10 - 12		
				dispersion max. 4		dispersion max.1,5)**	
203Y: 1100	168,0-170,0	1120		600	163,0-167,0				

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.77

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D5

D5

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MB 8,7 f

2. Edition

En

PES 6 A 100 C 320 RS3017

RQ 300/1275 AB 779
250/1250

supersedes 5.71

company: Daimler-Benz

engine: OM 360 h

..D..

RQ 300/1125 AB779
250/1100

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,5 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	4,0 - 4,5	0,4			
	6 12	0,6 - 1,6 7,9 - 8,9				
200	9	2,1 - 3,1				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

300/1275

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Test specifications Control rod travel mm 5	rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
1200	15,7-16,3	1200	16,0	1290 1330 1360 1420	15,6-16,0 6,2-12,5 0 - 8,5 0	580	0	200 300 400 480	6,6-8,1 4,4-6,6 1,0-3,6 0	-	-

Torque-control travel on flyweight assembly dimension a = 1300 = 0,5- 1 mm less control rod travel

Speed regulation: At

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
1250	96,0 - 99,0	500	500	max. 96,0	100	11,6 - 12,7

Checking values in brackets

12.75

B. Governor Settings

250-1250

MB 8,7 f

-2-

Checking of slider PRG check ①		Full-load speed regulation ④				Idle speed regulation ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
550	15,7-16,3	550	16,0	1270 1300 1350 1400	15,6-16,0 10,0-14,4 0 - 7,8 0	510	0	100 200 300 420	7,0-8,1 5,4-7,6 2,7-5,1 0	-	-

Torque-control travel on flyweight assembly dimension a = mm Speed regulation At 1300 0,5- 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3	rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	cm ³ /1000 strokes / mm 7
1250	96,0 - 99,0	500	500	max. 96,0	100	11,6-12,7

Checking values in brackets

B. Governor Settings

300/1125

Checking of slider PRG check ①		Full-load speed regulation ④				Idle speed regulation ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
1100	15,7-16,3	1000	16,0	1150 1180 1230 1290	15,6-16,0 9,0-14,0 0 - 7,6 0	570	0	200 300 400 470	6,8-8,1 4,7-6,9 1,2-3,8 0	-	-

Torque-control travel on flyweight assembly dimension a = mm Speed regulation: At 1150 = 0,5 - 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3	rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	cm ³ /1000 strokes / mm 7
1100	95,5 - 98,5	500	500	max. 96,0	100	11,6 - 12,7

En Checking values in brackets

B. Governor Settings

250/1100

MB 8,7 f

-3-

Checking of slider PRG check ①		Full-load speed regulation ④				Idle speed regulation ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
550	15,7-16,3	550	16,0	1120 1150 1200 1250	15,6-16,0 10,4-15,0 0 - 9,0 0	510	0	100 200 300 420	7,0-8,1 5,4-7,6 2,5-5,2 0	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation At 1150 = 0,5-

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3	rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	Control rod travel cm ³ /1000 strokes / mm 7
1100	95,5 - 98,5	500	500	max. 96,0	100	11,6 - 12,7

Checking values in brackets

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation ④				Idle speed regulation ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3	rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	Control rod travel cm ³ /1000 strokes / mm 7

En Checking values in brackets

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4

4. Edition

En

PES 6 P 110 A 720 RS 296

EP/RSV 400-1050 P0/396DR
P0/414DR

supersedes

6.75

company

John Deere

PES 6 P 110 A 720 RS 305

EP/RSV 400-1050 P2/399DR
P2/415DR

engine

6619

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(+0,15)
(-0,05)

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

See page 3!

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	16,3-17,0	0,7			
600	15	21,4-23,2				
200	9	6,6- 7,8				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

EP/RSV .. P 0/396DR, 414DR

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 39	1050 1100 1130	16,0 10,0 5,0	without auxiliary spring			ca. 20	400	6,8		
2a	1050 1160 1250	ca. 13,1 ca. 4,8 0,3-1,0					150 400 500 660	19 - 21 6,5-7,1 3,1-4,8 0 - 1	1050 500	0 0,3-0,5

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9	
LDA 1050	1,0 bar 186,0-188,0	1120-1135*	LDA 630	1,0 bar 190,0-194,0	100	170-210	400	19 - 29	
			LDA 550	0 bar 113,0-121,0	1195	24 - 44		cm ³ /1000	

Checking values in brackets

* 1 mm less control rod travel than col. 2

5.76

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EP/RSV.. 393DR

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 44	1070	16,0	without auxiliary spring			ca. 21	400	6,1	1050	0
	1140	10,6					200	19 - 21		
	1200	5,6					400	5,8-6,4		
	1050	ca. 12,5	with auxiliary spring				550	2,2-4,0	500	0,5-0,7
	1200	ca. 5,0					720	0 - 1		
2a	1350	0,3 - 1,0								

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9	
399DR	-LDA 0,9 bar	1120-1135*	LDA	0,9 bar	400	11 -19	400	11-19 cm³ / 1000 H.	
1050	159,0-161,0		650	166,0-170,0					
			LDA	0 bar					
			500	88,0-96,0	1195	24 - 44			

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

EP/RSV .. 415DR

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca.44	1070	16,0	without auxiliary spring			ca.21	400	6,1	1050 500	0 0,5-0,7
	1140	10,6					200	19 - 21		
	1200	5,6					400	5,8-6,4		
	1050	ca.12,5	550	2,2-4,0						
	1200	ca. 5,0	720	0 - 1						
2a	1350	0,3-1,0	with auxiliary spring							

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
-150-	LDA 0,9 bar	1090-1105*		LDA	0,9 bar	400	15 - 23		
1050	159,0-161,0			LDA	167,0-171,0				
				LDA	0 bar				
				500	88,0-96,0	1155	24 - 44		

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
296 / 396 DR + 414 DR	0,87 - 0,90	0,16 - 0,24	
305 / 399 DR + 415 DR	0,69 - 0,71	0,18 - 0,24	0,2 2,8
hydraulic stop 414 DR, 415 DR -	Locking at max. 0,76	Unlocking at mind. 0,48	

Notes:

(1) when n = 630 rev/min and 1,0 bar (= maximum full-load control rod travel) -Ppe 296
500 gauge pressure = 0,9 -Ppe 305

Dimension H - 396 DR = 29,7 mm

399 DR = 28,7 mm

414 DR = 29,7 mm

415 DR = mm

Section A:

Port-closing mark 13,25° camshaft after port closing of cylinder 1.

Test Specifications Fuel Injection Pumps ② and Governors

PE 6 P 110 A 320 RS 109

../..

RQ 200/1100 PA 121 R

RQV 200-1100 PA 176 R ./.

RQ 200/1000 PA 121 R ./.

RQV 200- 975 PA 282 R ./.

supersedes 9.74, 3.75

company: AEC

engine:

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(+0,15)
(-0,05)

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	13,2 - 13,9	0,5			
600	9	6,4 - 7,6				
600	12	13,2 - 14,7				
600	15	19,0 - 20,9				
200	9	4,8 - 6,0				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQ 200/1100 PA 121

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5		rev/min 6		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 10		rev/min 11		Torque control Control rod travel mm 12	
500	15,7-16,3	500	16,0	1100	15,5-16,0	1150	8,3-13,4	430	0	100	6,0-8,1	-	-	-	-
				1200	0 - 8,7					200	3,4-5,7				
				1230	0					300	0 -1,5				
										330	0				

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6		Control rod travel mm 7	
1100	114,0-116,0	1100							

Checking values in brackets

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	965 1000 1060 1140	15,0-18,3 10,5-15,0 0 - 6,5 0	-	-	-	ca. 12	180 250 400 610	6,5-8,2 3,0-4,8 1,8-3,3 0	965	8,3
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
800	145,5-147,5	990						

Checking values in brackets

* 1 mm less control rod travel than col. 2

RQV 200-1100 PA 176 R

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1100 1200 1300 1400	15,7-17,8 8,0-12,6 0 - 6,6 0				ca. 10	160 220 300 460	7,0-8,0 2,3-4,0 1,5-3,0 0	1100	8,3
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1100	114,0-116,0	1120						

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 KHD 40,5 b

1. Edition

En

PE 12 P 120 A 920 RS 294 EP/RSUV...348 R, 352

PE 8 P 120 A 620/4LS 325 EP/RSUV...321 R, 461 R, 347 R

Cam sequence and angular cam spring see KHD 40,5 a, page 4!

supersedes

company

engine

KHD

BA 12 M 816

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{2,00-2,10} (1,95-2,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	10,5-10,6	16,2-16,6	0,5(0,8)			
250	6,2-6,4	1,7- 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RSUV 250-800 P 10 A 347 R

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0				ca. 30	250	5,8	800	10,5-10,6
		x = 5,25					250	6,2-6,4	270	11,7-12,3
ca. 67		840-855=9,5					300-335 = 2,0		350	10,5-10,7
②a		870-900=4,0								
		1000=0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...				Idle			
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
		840-855*				100	19,5-21,0		
see KHD 40,5 a, page 5!									

Checking values in brackets

* 1 mm less control rod travel than col. 2

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11.79

D18

DA?

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control		
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	
loose	800	0,3-1,0				ca. 20	300	6,0			
	x	= 2,5					300	6,3-6,5			
ca. 67	1040-1050 = 9,5						335-395	= 2,0			
2a	1060-1090 = 4,0										
	1190 = 0,3-1,7										

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery		⑤ ④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)				Idle			
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
**		1040-1050*			100	(80)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

RSV 250 - 1000 P7/461 R

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0				ca.23	250	5,5		
	x =	5,5					250	5,9-6,1		
	1040-1050 = 9,5	315-375 = 2,0								
	1055-1085 = 4,0									
ca.66	1200 = 0,3-1,7									
②a										

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery		⑤ ④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)				Idle			
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
**	see KHD 40,5 a	1040-1050*							
		page 5!							

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0				ca. 30	250	6,0	220	11,7-12,3
	x =	5,0					250	6,4-6,6	350	10,5-10,6
ca. 70	640-650 = 9,5						270-330 = 2,0		600	10,5-10,6
②a	655-685 = 4,0									
	800 = 0,3-1,7									

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤ ④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
	**	640-650*				100	19,5-21,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

RSUV 300...1000 POA 352

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0				ca. 24	300	6,0	1000	10,5-10,6
	x =						300	6,3-6,5	400	10,5-10,6
ca. 69	1040-1050 = 9,5						335-395 = 2,0		270	11,7-12,3
②a	1060-1090 = 4,0									
	1220 = 0,3-1,7									

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤ ④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
		1040-1050*				100	19,5-21,0		
**	see KHD 40,5 a, page 5!					100	(80)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

11.79

Test Specifications Fuel Injection Pumps ① and Governors

PE 6 P 110/320 RS 211 RQV 112 KR, 173KR

..A..

200 KR, 247 KR

supersedes 1.75

company: Allis Chalmers

engine: 11 000

Test equipment as per VDT-W 400/305!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(+0,15)
(-0,05)

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	16,0 - 16,8	0,7			
600	9	8,4 - 9,6				
600	12	15,1 - 16,6				
600	15	21,4 - 23,2				
200	9	6,7 - 8,0				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

300-1100 PA173KR

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1100 1150 1200 1280 1360	14,8-17,6 10,7-14,7 6,0-11,4 0 - 5,6 0	-	-	-	ca. 10	250 300 400 570	6,2-8,0 4,2-6,5 0,2-5,6 0	350 600 1000	1,8-3,0 3,9-4,4 7,0-7,4
						③a			-	-

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1090	138,0-140,0	1120	800 600	143,0-147,0 144,0-150,0	100 300	210 19,0-23,0		
					150-250 U/min.			./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.78

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B. Governor Settings

300 - 1025 PA173KR**
300 - 1000 PA112KR*** Ppe 211

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1050 1100 1150 1200 1300	15,0-18,0 10,8-15,0 5,8-11,6 0,7- 7,8 0				ca. 10	250 300 350 400 550	6,4-8,0 4,8-7,0 3,0-3,8 2,2-3,8 0	380 550 1000	1,8-2,6 3,8-4,6 7,5-7,9
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
** 1015	89,0-91,0	1145-1155*	700	96,0-100,0	100	210		
*** 990	120,0-122,0	1020	700	123,0-127,0	300	19,0 - 23,0 150 - 250		

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

375 - 1100 PA 200 KR

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1100 1150 1200 1250 1360	15,0-18,0 11,0-15,0 6,6-11,8 1,8- 8,6 0				ca. 24	200 300 400 600 850	12,8-15,0 8,4-11,6 5,0- 6,8 3,1- 4,4 0	370 900 1270 1360	3,0-3,6 6,0-6,5 End (11)
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1090	137,0-141,0	1120	800 600	146,0-151,0 150,0-158,0	370 300 100	8,0 -18,0 89,0 -99,0 210		
						180-230 U/min.		

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

300-900 PA 173 KR

Ppe 211

-3-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1050 1100 1150 1200 1300	15,0-18,0 10,8-15,0 5,8-11,6 0,7- 7,8 0	-	-	-	ca. 10	250 300 350 400 550	6,4-8,0 4,8-7,0 3,0-5,2 2,2-3,8 0	380 550 1000	1,8-2,6 3,8-4,6 7,5-7,9
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4a	4	5	6	7	8	9
900	110,0-117,0	910 - 920		800 600	107,0-120,0 107,0-124,0	100 300	210 19,0 - 26,0		
							150-250 U/min		

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

375 - 1100 PA247KR

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1130 1200 1300 1390	15,0-17,6 9,0-13,5 0 - 7 0	-	-	-	ca. 20	300 400 600 850	9,6-12,7 4,8- 6,4 2,8- 4,1 0	300 400 800 1130 1300 -1390	0-1,4 2,8-3,4 5,0-5,4 8,3 End (11)
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4a	4	5	6	7	8	9
0,6 1090	bar 138,0-140,0	1145-1155*		0,6 600 0 600	bar 151,0-157,0 bar 100,0-108,0	100 -375 300	210 8,0 - 18,0 118,0-128,0		
							200 - 300 U/min		./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

D. Adjustment Test for Manifold Pressure Compensator

Ppe 211

-4-

Test at n =

rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
211 / 247 KR	0,12	0,41	- 2,1 - 2,2 - 0,2 - 0,4

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications

Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 PEN 12,0 a 1

1. Edition

En

PE 6 P 110 A 320 RS 175 y RSV 200-900 P 4/421 R

supersedes -

company

engine

Volvo-Penta
TD 120

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,6-2,7}{(2,55-2,75)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,9+0,1	16,9-17,1	0,4(0,8)			2,5 ± 0,1
225	5,6-5,8	1,1- 1,5	0,25(0,55)			(2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0				ca. 23	225	5,1-5,3	-	-
	X =	5,0					100	min. 19,0		
ca. 55	9,9	940-950					225	5,6-5,8		
	4,0	965-995					290-350	= 2,0		
2a	1100	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)				Idle			
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
700	169,0-171,0 (166,0-174,0)	940-950*		-	-	225	13,0-17,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.81

BOSCH

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E3

-E3

Test Specifications Fuel Injection Pumps **(1A)** and Governors

40

WPP 001/4

1. Edition

En

PES 6 P 100/720 RS 72

EP/RSV 250-750 P5 V 10997

supersedes

company

Kaelble

engine

MD 230 s-T

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,80-2,90}{(2,75-2,95)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,4 - 13,2	0,5			
600	9 15	5,4 - 6,4 17,3 - 18,8				
200	9	3,6 - 4,6				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

(1) Upper rated speed rev/min			Intermediate rated speed			(4) Lower rated speed			(3) Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 63	750 780 800	16,0 12,0 5,5	without auxiliary spring			ca. 26	250	8,0	730	0
(2a)	775 800 870	ca. 11 ca. 6 0,3-1,0					50 250 300 380	ca. 20 7,7-8,3 2,0-5,5 0 - 1	300	1,2-1,8

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop		(6) Rotational-speed limit	(3a) Fuel delivery characteristics		Starting fuel delivery		(4a) Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...	Note: changed to ...		Idle		Control rod travel	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
730	118,0-121,0	760						

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.80

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E4

E4

Test Specifications Fuel Injection Pumps and Governors

VDT-WPP 001/4 DAF 8,3 e

4. Edition

En

PE 6 MW 100/720 RS7 RW 250/1200 MW 5

For LDA (manifold-pressure compensator)

refer to VDT - W - 420/302

See note on page 2!

supersedes 6.75
company D A F
engine: DU 825

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,0 + 0,1$ mm (from BDC) 10,5 Control rod travel
(1,95-2,15)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (compensating valve) mm
1	2	3	4	2	3	6
1000	11,4	10,9 - 11,1	0,3(0,6)			
250	(+ 0,1) 6,1 (+ 0,2)	0,8 - 1,0	0,3(0,5)			
1000	-	(C4-C5)	0,4(0,7)			

Set uniform delivery according to the values in

Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min	Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min		Rotational speed rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
ca. 25 (+ 1)	min. 9,5 6,1 with contact max. 1,0	100-150 240-260 250-260 - 530-580	ca. 58 (+ 4)	ca. 11,4 10,4 4,3 max. 1,0	1200-1220 1240-1250 1260-1320 1320-1380		100 - 500	20,5-21,5 - - - - - -
① ② ③ ④ ⑤			⑦ ⑧ ⑨ ⑩ ⑪				⑫ ⑬ ⑭ ⑥	Switching point 150-200(125-225)

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery Test oil temp. 40°C (104°F)		Full-load speed regulation	Variations in fuel delivery		Starting fuel delivery Idle		Difference
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	cm ³ /1000 strokes
1	2	3	4	5	6	7	8
LDA 1000	0,4 bar 109,0-111,0 (107,5-112,5)	1240-1250* (1235-1255)	LDA 1000	0 bar 91,5-94,5 (90,0-96,0)	100 250	mind. 151 8,3-10,3	10,0 3,0 (5,0)
							⑫a ⑮ ⑯

Checking values in brackets

less control rod travel than in Column 2

D. Adjustment Test for Manifold Pressure Compensator

-2-

DAF 8,3 e

Test at n = rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
7 / MW 5	0,25	0,16	0,1 - 0,2 0,9 - 1,2

Notes:

(1) when n = 1000 rev/min and gauge pressure = 0,4 bar (= maximum full-load control rod travel)

Sliding-sleeve idle travel = 7,0 + 0.25 mm

** - 11,4 mm - is the full-load control-rod travel set in Section A, 1-3.

Test Specifications Fuel Injection Pumps and Governors

En

PES 6 MW 100/320 RS 5 0 413 206 001

RWV 300...1400 MW 13 0 420 093 006

supersedes 7.79
company Volvo
engine TD 60

1 - 5 - 3 - 6 - 2 - 4 = 0 -60-120-180-240-300 ± 0,5(0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,50-2,60 mm (from BDC) 9,0-12,0 Control rod travel
(2,45-2,65)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (compensating valve) mm 6
1000	10,0+0,1	7,6 - 7,8	0,35(0,6)			
300	5,7-5,9	1,5 - 1,9	0,35(0,55)			
550	Sect. C.	col. 4,5	0,35(0,6)			

Set uniform delivery according to the values in

Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever 1	Control rod travel mm 2	Rotational speed rev/min 3	Degree of deflection of control lever 4	Control rod travel mm 5	Rotational speed rev/min 6		Rotational speed rev/min 8	Control rod travel mm 9
20	① 8,5	100-200	82±4	⑦ 9,7-9,9	1400		⑫ 100	20,5-21,5
	② 5,7-5,9	300		⑧ 8,8	1440-1450		⑬ 1000	10,0-10,1
	③ **	325		⑨ 4,0	1520-1560		⑭ 700	9,5- 9,7
	④ -			⑩ 0 -1,0	1670		⑮ 550	9,4- 9,6
	⑤ 2,0	420-470	40+5	⑪			⑯ Switching point	
							100-230(80-240)	

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery ⑰		Full-load speed regulation ⑱a		Variations in fuel delivery ⑲		Starting fuel delivery idle		Difference cm ³ /1000 strokes 8
Test oil temp 40°C (104°F)								
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	
LDA 1000	0,27 bar 76,4-78,4 (74,4-80,4)	1440-1450* (1435-1455)		LDA 550	0,27 bar 59,3-63,3 (57,3-65,3)	300	15,8-19,8	3,5

Checking values in brackets

less control rod travel than in Column 2

5.82

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D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 550 rev/min decreasing pressure - in bar gauge pressure

VOL 6,0 b

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
RS 5/MW 13	0,2	0,14 0	0,1 - 0,2 0,6 - 0,8 1,0 - 1,2

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

1. Sleeve idling travel 4.25 ± 0.1 mm
2. Whilst stationary a starting control-rod travel of approx. 21 mm must be attained.
3. ++ At this engine speed the auxiliary idle spring must just touch. Idle delivery must not be affected.

Test Specifications

Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 10,0 p

1. Edition

En

PE 6 P 110 A 320 RS 418 RQV 325-1100 PA 232

supersedes -

company: Volvo

engine: THD 100 D

176,5 kW (240 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke (2,55-2,75)
 2,60-2,70 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	9,5-9,6	15,1 - 15,3	0,4(0,8)			25 ± 0,1 mm
325	4,6-4,8	1,2 - 1,6	0,3(0,7)			(2,2-2,9 mm)

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1175 1350	15,2-17,8 0 - 1,0				ca. 13	100 325	min. 6,0 4,6-4,8	325 450 1150	1,7 2,5-2,9 8,1
ca. 43	8,5 4,0	1140-1150 1190-1220				335-450 ③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥	Torque-control ⑤ travel Control rod travel mm		
rev/min 1	cm³/1000 strokes 2	rev/min 3 ④a	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 700	0,7 bar 151,0-153,0 (148,0-156,0)	1140-1150*	LDA 700	0 bar 134,0-138,0 (131,0-141,0)	100	20,0-21,0 mm RW 370 - 420		

Checking values in brackets

* 1 mm less control rod travel than col. 2

7.81

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

VOL 10,0 p

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE 6 P ... 418 RQV...PA 232	0,7	0,28 0,21 0	9,5 - 9,6 9,2 - 9,4 8,8 - 8,9 8,7 - 8,8

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 VOL 10,0 b 2

4. Edition

40

En

PE 6 P 100 A 320 RS 100 RQV 250-1100 PA 232/2 R
Port-closing test with/without ROBO diaphragm

supersedes 2.81

company: Volvo

engine: T (H) D 100

** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

(2,55-2,75)
2,60-2,70

mm (from BDC)

RW 10,5

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 8
700	13,0	14,5 - 14,7	0,4(0,6)			2,5 ± 0,1 ** (max. 2,2-2,9)
250	+0,1 5,9-6,1	1,1 - 1,5	0,25(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQV ... 232/2 R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 50	1100 1350	15,2-17,8 0 - 1				ca. 12	100 250 320-380=2,0	min. 7,6 5,9-6,1	200 500 800 1100	0,7-0,9 3,0-3,3 5,2-5,5 8,0
ca. 47	12,0 4,0	1140-1150 1230-1260				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 700	0,5 bar 145,0-147,0 (143,0-149,0)	1140-1150*	LDA 700	0 bar 116,0-118,0 (114,0-120,0)	100 250	20 - 21 11 - 15		
dispersion max. 2,5 (5)								

Checking values in brackets

* 1 mm less control rod travel than col. 2

8.81

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D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure

VOL 10,0 b 2

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
100 / 232/2 R	0,5 bar	0,23 0,12 0,	13,0 - 13,0 12,7 - 12,8 11,6 - 11,8 11,3 - 11,4

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 6,0 n

4. Edition

En

PES 6 MW 100/320 RS 1004 Z

RQV 300 ... 1400 MW 22

0 403 446 110

supersedes 5.81
company: VOLVO
engine: TD 60 B

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,80-2,90}{(2,75-2,95)}$ mm (from BDC) RW = 9 - 12 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	10,6+0,1	8,35 - 8,55	0,35(0,6)			
300	5,2-5,4	0,95 - 1,35	0,35(0,55)			
1400			0,4(0,7)			
500			0,35(0,6)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel ①	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 64	1400 1700	15,2-17,8 0,0- 1,0				ca. 11	100 300	min. 7,0 5,2-5,4		
ca. 60	9,6 4,0	1140-1450 1565-1595				③a	440-500	=2,0		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1000	0,67 bar 83,5-85,5 (81,5-87,5)	1440-1450*	LDA 1400	0,67 bar 85,0-89,0 (84,0-90,0)	100 300	min. 120 9,5-13,5 (7,0-16,0)		
			LDA 500	0 bar 48,0-50,0 (46,0-52,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2
5.82

D. Adjustment Test for Manifold Pressure Compensator VOL 6,0 n -2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference
			mm (1)
RS 1004 Z MW 22	0,3%		10,3 - 10,5
		0,67	10,6 - 10,7
		0	9,7 - 9,8

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 PER 10,0 b

5. Edition

En

PES 8 MW 100/320 RS 1011
RQV 375...1250 MW 18
Komb.-Nr. 0 403 448 100

supersedes 2.82
company: Perkins
engine: ATV 8.640

SOD-TDC mark see page 2!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,50-2,60$
($2,45-2,65$) mm (from BDC) RW = 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	10,8+0,1	9,35 - 9,55	0,35(0,6)			
375	4,9-5,1	1,05 - 1,45	0,35(0,55)			
800			0,5(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1250	15,2-17,8	25-45	700	4,7	ca. 12	100	min. 11,5	1310	
	1500	0,0- 1,0		450	8,3		375	4,9-5,1	1330	7,8
ca. 64	9,8	1315-1325							450	3,2
	4,0	1365-1395						485-545 = 2,0	570	
									375	1,6-1,7

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
1250	93,5-95,5 (91,5-97,5)	1315-1325*	800	87,5-91,5 (85,5-93,5)	100	min. 140 10,5-14,5 (8,0-17,0)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

5.82

PER 10.0 b

SOD-TDC mark
=====

*CS between SOD-TDC

Assy. No.
... 100

with CRT 10.5 mm
16.5°

with CRT 21 mm (starting)
10.5°

En

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4

1. Edition

En

PE 6 P 120 A 420 LS 152 RQV 300-950 PA112KR

300-875

Test-pressure line 8 x 2 x 1000 = 1 680 750 060!

supersedes

company:

engine:

Allis Chalmers

Mark II

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	26,7 - 27,3	1,0			
600	6	7,4 - 8,6				
	12	23,6 - 25,5				
	15	32,8 - 35,3				
200	6	3,5 - 4,5				

Adjust the fuel delivery from each outlet according to the values in .

300-950

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 66	1050 1100 1150 1210 1300	15,0-18,0 10,7-15,0 6,0-11,6 0-7 0	-	-	-	ca. 10	250 350 450 550	6,4-8,0 3,0-5,2 1,3-2,8 0	400 550 1000	1,8-2,7 3,8-4,2 7,5-7,9
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
950	208,0-210,0	980-990* (VH ca 61°)	750	195,0-199,0	100 300	270 - 310 19 - 25		

Checking values in brackets

* 1 mm less control rod travel than col. 2

4.76

BOSCH

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Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	875 900 980 1060	15,0-17,6 12,0-15,4 3,2- 8,0 0	-	-	-	ca. 10	120 200 350 550	6,3-8,0 4,9-7,1 1,7-3,1	350 700	2,3-2,8 5,4-5,9
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
875	164,0-166,0	900-910*	600	140,5-144,5	100	270 - 310		
					300	19 - 25		

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4

1. Edition

En

PES 6 P 110 A 720 RS 296

EP/RSV 400-1050 P 0/426 DR

supersedes 426 DR 5. Edition

company John Deere

engine 6619 A

See page 2!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,75±0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	16,3 - 17,0	0,7			
600	15	21,4 - 23,2				
200	9	6,6 - 7,8				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed 4 5 6			4 Lower rated speed Control-lever deflection in degrees 7		rev/min 8		Control rod travel mm 9		3 Torque control Control rod travel mm 11	
ca. 39	Control rod travel mm 2	Control rod travel mm rev/min 3	without auxiliary spring			ca. 20	Control-lever deflection in degrees 7	400	6,8	1050	0	500	0,3-0,5
	1050	16,0											
	1100	10,0						150	19 - 21				
	1130	5,0						400	6,5-7,1				
2a	1050	ca. 13,1	with auxiliary spring					500	3,1-4,8				
	1160	ca. 4,8						660	0 - 1				
	1250	0,3-1,0											

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limit Note: changed to ...)	3a Fuel delivery characteristics		Starting fuel delivery Idle		5	4a Idle stop	Control rod travel mm
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	9	
LDA 1050	1,0 bar 174,0-176,0	1095-1105*	LDA 650	1,0 bar 177,0-181,0	100	min. 160	400	6,8	
			LDA 550	0 bar 83,0- 91,0	400	20 - 28, dispersion max. 4			
					1155	26 - 42, dispersion max. 6		./.	

Checking values in brackets

* 1 mm less control rod travel than col. 2

10.77

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D. Adjustment Test for Manifold Pressure Compensator

Ppe 296

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel: diminution difference mm (1)
296 / 426 DR	0,05 - 0,08	0,75 - 0,82	

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MB 3,0 i
3. Edition

En

PES 5 MW 55/320 RS 18
EP/RSV 350 - 2000 MWO / 307 R

supersedes 8.78
company Daimler-Benz
engine

1 - 2 - 4 - 5 - 3 = 0 - 72 - 144 - 216 - 288° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

See page 2!

A. Fuel Injection Pump Settings

Port closing at prestroke (1,65-1,85) mm (from BDC) 21,0 mm RW

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	13,7±0,1	3,75 - 3,85	0,25(0,3)			
350	6,9-7,1	0,6 - 0,8	0,1(0,15)			
1600/1980	Sect. C, col. 4,5		0,25(0,30)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed			4 Lower rated speed Control-lever deflection in degrees 7			3 Torque control Control rod travel mm ± 0,1	
Control rod travel mm 2	Control rod travel mm rev/min 3		4	5	6	rev/min 8	Control rod travel mm 9		rev/min 10	mm 11
loose	800	0,3-1,0				22±4°	350	6,9-7,1	1000	13,7
							350	**		
							100	min.19		
59 ± 4	11,7	2015-2025					350	6,9-7,1	1600	12,9
2a	5,8	2100-2120				430-	490	2,0	1980	12,5

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limit Note: changed to) rev/min		3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1000	37,5-38,5 (36,5-39,5)	2015-2025* (2010-2030)		1600	39,0-41,0 (38,0-42,0)	100	min.56,0		
				1980	39,0-41,0 (38,0-42,0)	350	6,5-7,5 (6,0-8,0)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

5.82

K5

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MB 3.0 i

**** At this engine speed override poppet by 0.4 ± 0.1 mm.
The idle delivery must not be affected.**

En

Test Specifications Fuel Injection Pumps ② and Governors

En

PE 8 P 100 A 320 LS845 RQ 300/1250PA 187R (1)

PE 8 P 110 A 320 LS844 RQ 300/1250PA 473R (2)

8 - 7 - 2 - 6 - 3 - 5 - 4 - 1 + 0,50

0 - 45 - 90 - 135 - 180 - 225 - 270 - 315° (± 0,75)

supersedes -

company: Daimler Benz

engine: OM 402

(1 - 188kW-256PS)

(2 - 235kW-320PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $\frac{3,40-3,50}{(3,35-3,55)}$ mm (from BDC) Cyl. 8

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery (1) cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery (2) cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	11,1	10,2 - 10,4	0,3(0,6)	11,5	12,9 - 13,1	
	+ 0,1			+ 0,1		
300	7,4-7,6	1,3 - 1,9	0,3(0,5)	6,5-6,7	1,3 - 1,9	
450	- - -	- - -	0,6(1,0)	- - -	C, 4-5	

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQ..187 R (1)

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2		Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6		Control rod travel mm 8	Control rod travel mm 9	Control rod travel mm 10		Control rod travel mm 12	
600	13,8-14,6	600	14,2	10,1	1295-1310	300	7,5	100	min. 9	-	-
				4,0	1345-1375			300	7,4-7,6		
1250	13,0-13,4	ca. 49°						405-445	=3,0		
1500	0 - 1							500	0 - 1		

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3	Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
cm ³ /1000 strokes 2			cm ³ /1000 strokes 5		cm ³ /1000 strokes 7	Control rod travel mm
1250	102,0-104,0 (100,0-106,0)	600			100	120 - 140
						./.

Checking values in brackets

5.79

B Governor Settings

Checking of slider PRG check (1)		Full-load speed regulation (4)				Idle speed regulation (5)				Torque control (3)	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
700	19,2-20,8	700	20,0	10,5	1295-1310	300	6,6	100	min.8,1		
1250	Breakaway	ca.49°		4,0	1355-1385			300	6,5-6,7		
								420	450=2,0		

Torque-control travel
on flyweight assembly dimension a

mm

Speed regulation At

1 mm less control
rod travel**C. Settings for Fuel Injection Pump with Fitted Governor**

Full-load delivery on governor control lever Test oil temp 40°C (104 F) (2)		Control rod stop (3a)	Fuel delivery characteristics (3b)		Starting fuel delivery idle speed (6)	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes / mm 7
LDA 1250	0,7 bar 129,0-131,0 (126,0-134,0)		LDA 150	0 bar 83,0-86,0 (80,0-89,0)	100 24 V-Electromagnet	120 - 140

Checking values in brackets

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel
	Gauge pressure bar	Gauge pressure bar	mm (1)
844 / 473 R	0,70	0,33 0,24 0	11,5 - 11,6 11,0 - 11,1 10,3 - 10,5 9,7 - 9,9

Notes:

(1) when n =

En

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

40
WPP 001/4 SCA 8,0 b i
3. Edition

En

PE 6 P 110 A 720 RS 261, Y RQV 200-1200 PA170R
.. RS 261, Y EP/RSV 350-1200 P 1/310R

supersedes 1.78
company: Scania
engine: D 8

** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,0 \pm 0,1$ mm (from EDC) $\begin{pmatrix} +0,15 \\ -0,05 \end{pmatrix}$						
Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,0 - 9,7	0,4			$2,5 \pm 0,1^{**}$ (max. 2,2-2,9)
600	15	14,0 - 15,8				
200	9	1,2 - 2,0				

Adjust the fuel delivery from each outlet according to the values in 

B. Governor Settings

RQV .. 170 R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 66	1240 1300 1430 1590	15,0-17,6 11,3-14,9 2,2- 8,5 0	-	-	-	ca. 10	100 250 400 530	6,4-8,0 3,9-6,0 1,7-3,2 0	300 600 1240	1,6-2,4 4,3-4,6 8,2
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1200	88,5-91,5	1240-1250*	600	83,5-88,5	100	130 -170		
"Y" 1200	95,0-97,0	1240-1250*	600	95,0-98,0	225	8,0-12,0)** dispersion max. 2		./.
					1300	39,0-44,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

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The numbers denote the sequence of the tests

B. Governor Settings

EP/RSV..310 R

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				rev/min	Control rod travel mm		rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 71	1200	16,0	without auxiliary spring			ca. 31	350	6,0	max.	
	1250	11,9					100	19 - 21		
	1300	6,3					350	5,7-6,3		
②a	1250	10,8-12,4	with auxiliary spring				400	3,3-4,5		
	1320	2,4- 6,0					520	0 - 1		
	1420	0,3- 1,0								

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
1200	88,5-91,5	1235-1245*		600	83,5-88,5	100	130-170		
"γ"						350	8,0-12,0		
1200	95,0-97,0 (92,0-100,0)	1240-1250*		600	96,5-99,5 (93,5-102,5)	1335	4,0mmRW		
							dispersion max.2 (4)**		
							dispersion max.6 (9)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				rev/min	Control rod travel mm		rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
②a										

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

PE 6 P 110 A 320 RS 141

RQV 250-1100 PA 232/2R

supersedes -

company:

Volvo

engine:

THD 100 D

176,5 kW (240PS)

** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,60-2,70 mm (from BDC) RW 10,5

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,1	15,1 - 15,3	0,4(0,8)			2,5+0,1** (max. 2,2-2,9)
	+0,1					
250	5,0-5,2	0,9 - 1,3	0,3(0,7)			
700	- - -Sect. C, col. 4,5		0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sieve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1100 1350	15,2-17,8 0 - 1				ca. 11	100 250 305-365	min. 6,7 5,0-5,2 =2,0	250 450 1150	1,1 2,5-2,8 8,1
ca. 43	9,2 4,0	1140-1150 1200-1230				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b ④a	Fuel delivery characteristics high idle speed ⑤a ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel Control rod travel mm ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
LDA 700	0,6 bar 151,0-153,0 (148,0-156,0)	1140-1150*	LDA 700	0 bar 133,5-136,5 (130,5-139,5)	100	20-21 mmRW 380 - 420		

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure increasing

VOL 10,0 n

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
141 / 232/2R	0,28	0,22	9,9 - 10,0 9,5 - 9,7

Notes:

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

PE 6 P 110 A 320 RS 273 RQV 250-1100 PA 238/2R

supersedes -
company: Volvo
engine: TD 100 B

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{2,6-2,7}
(2,55-2,75) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery ² cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,6+0,1	15,5-15,7	0,4(0,8)			2,5 ± 0,1
250	5,4-5,6	0,9- 1,3	0,3(0,6)			(2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca. 13	100 250	min. 8,3 5,2-6,1	350 600 1290	1,7-2,3 3,7-4,3 8,8
ca. 40	9,6 4,0	1140-1150 1240-1260				3a	335-370=2,0mm			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA	0,8 bar 155,0-157,0 (152,0-160,0)	1140-1150*	LDA 700	0 bar 105,5-108,5 (102,5-111,5)	100	20,5-21,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

VOL 10,0 f 1

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE 6 P..RS 273 / ..PA 238/2 R	0,6	0,56 0,25 0,07	10,5 - 10,6 10,5 - 10,6 8,5 - 8,6 8,5 - 8,6

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 MB 16,0 b

3. Edition

En

PE 10 P ..520/5 LS 800, 804 RQV 350-1100 PA182
PE 10 P..320 LS 809, 814 RQV 350-1000 PA182
814Z

supersedes 5.74
company: Daimler Benz
engine: OM 403

10 - 9 - 4 - 1 - 8 - 7 - 6 - 3 - 5 - 2 - 10 (+ 0,5)
0 -45 -72-117-144-189-216-261-288-333-360° (- 0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,80-2,90 Cyl. 10
(2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	8,1 - 8,8	0,4			
600	9	2,7 - 3,7				
600	12	6,3 - 7,5				
600	15	0,9 - 12,4				
200	9	0,5 - 1,4				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

350 - 1100

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1100 1200 1300 1400	16,8-19,4 8,8-13,7 0 -7,0 0	-	-	-	ca. 18	250 400 550 770	10,0-11,7 5,4- 7,6 2,8- 4,3 0	1165	8,4
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
1100 814Z: 1100	86,0-88,0 (84,0-90,0) 82,0-84,0 (80,0-86,0)	1120-1130	1225- dispersion max. 6	1245: 5mmRM	100 300- Change-over point	11 - 13 230 U/min.		

Checking values in brackets

* 1 mm less control rod travel than col. 2
3.76

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L11

L11

B. Governor Settings

350-1000 MB 16,0b

-2-1

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1000 1060 1130 1200	16,6-19,0 9,0-14,0 0 - 7,4 0	-	-	-	ca. 18	200 350 500 650 770	10,4-11,7 6,2- 9,3 4,0- 5,5 1,5- 2,7 0	1040	8,4
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1000	85,0-87,0	1020-1030			100	11 - 13		
			1080-1100	5,0 mmRW dispersion max. 6	Change-over point 300-230 U/min.			

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 PEN 12,0 a

4. Edition

En

PE 6 P 110 / 320 RS 175
(A) RS 175, Z

EP/RSV 200-900 P1/305 (1)
P4/305,421 (2)

supersedes 8.77
company Volvo-Penta
engine MD 120 (1)
TMD120 (2)

**

In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,6 + 0,1$ mm (from BDC) $(+ 0,15)$
 $(- 0,05)$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	17,9 - 18,7	0,6			$2,5 \pm 0,1^{**}$ (max. 2,2-2,9)
600	6	3,0 - 4,2				
600	12	17,3 - 18,8				
600	15	23,5 - 25,3				
200	6	1,1 - 2,1				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 50	900	16,0	without auxiliary spring			ca. 24	200	6	900	0
	950	12,0					100	19,0-21,0	350	0
	1000	6,6					200	5,7- 6,3	250	1,2-1,8
							300	0 - 2,4		
2a	980	7,2-10,2	with auxiliary spring				360	0 - 1		
	1020	1 - 6								
	1100	0 - 1								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to) rev/min							
rev/min 1	cm ³ /1000 strokes 2	3	4	cm ³ /1000 strokes 5	6	rev/min 7	cm ³ /1000 strokes 8	rev/min 9	Control rod travel mm 10
700	119,0-121,0 (118,0-122,0)	910			100	ca. 21mmRW			
					225	13,0-17,0			
					dispersion max. 2,5)**				
									./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

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L13

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The numbers denote the sequence of the tests

200-900 P 4/305, 421

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 55	900 950 1000	16,0 11,4 4,0	without auxiliary spring			ca. 25	200	6,0		
②a	960 1000 1100	8,0-11,6 2,0- 6,6 0 - 1					100 200 250 350	19 - 21 5,7-6.3 3,0-4,4 0 - 1	900 350 250	0 0 1,2-1,8

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limit.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
(2) 700	119,0-121,0 (116,0-124,0)	910				100	ca. 21 mmRW		
"Z" 700	196,0-198,0 (193,0-201,0)	910				225	13,0-17,0 dispersion max. 2,5)**		

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
②a										

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limit.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPC 001/4 MB 11,8 b

4. Edition

En

PE 6 P 100/720 RS 15 EP/RSV 300-1100 P 1/303R (1-2)

..A..

300- 750 P 1/365 R (3)

(350-750)

300-900 P 1/365R (4)

(350-900)

supersedes 5.74

company Daimler-Benz

engine OM 355 (A)

(1) Kaelble 210 PS

(2) Menck 220 PS

(3-4) governor

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

2,80-2,90

Port closing at prestroke

(2,75-2,95)

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,3 - 10,3	0,4			
	6	2,6 - 3,4				
	9	5,9 - 6,7				
200	9	2,5 - 3,3				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

..303 R (1-2)

① Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed			④ Lower rated speed Control-lever deflection in degrees 7			③ Torque control Control rod travel mm 11	
Control rod travel mm 2	Control rod travel mm rev/min 3		4	5	6	rev/min 8	Control rod travel mm 9		rev/min 10	mm 11
ca. 60	1100 16,0 1150 11,0 1200 4,0		without auxiliary spring			ca. 24	300 7,0		1080	0
②a	1170 6,2-10,2 1200 4,5- 3,6 1350 0,3- 1,0						100 19 - 21 300 6,7-7,3 450 1,8-4,1 600 0 - 1		300	0,7-1,3

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp 40°C (104°F) rev/min 1		⑥ Rotational-speed limit Note changed to) rev/min 3		③a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		⑤ Idle stop Control rod travel mm 9	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7		rev/min 8	
(1-2) 1100	115,0-117,0	1120				100	ca. 150,0		./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

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7.78

L15

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B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 37	750 780 820	16,0 9,2	without auxiliary spring			ca. 17	300	7,1		**
ca. 36	750 780 860	ca. 13,0 ca. 5,0 0,3-1,0					100 300 350	19 - 21 6,6-7,8 0 - 1		
②a			with auxiliary spring							

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.	③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)			Idle			
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
(3) 730	106,0-108,0	750-760*		780-795:4,9 mmRW dispersion max. 6				

Checking values in brackets

* 1 mm less control rod travel than col. 2

** Set idle-speed auxiliary spring at 2 mm control-rod travel.
then turn back 1/2 turn.

300-900 P1/365R (4)

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 37	750 780 820	16,0 9,2 3,5	without auxiliary spring			ca. 17	300	7,1		**
ca. 40	900 940 1000	ca. 12,0 ca. 4,6 0,3-1,0					100 300 350	19 - 21 6,6-7,8 0 - 1		
②a			with auxiliary spring							

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.	③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)			Idle			
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
(4) 880	106,0-108,0	895-905*		935-950:4,6 mmRW dispersion max. 6				

Checking values in brackets

* 1 mm less control rod travel than col. 2

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 11,1 1 2

40

1. Edition

En

Testoil-ISO 4113

PES 6 P 110 A 720 LS295 RQV 250-1100 PA373DR (1)
 LS345 RQV 250-1100 PA373DR (1)
 LS295 RQV 250-1100 PA276DR (2)

supersedes -
 company M A N

engine: D 2566 MTUH (1)
 (280 PS)
 D 2566 MTE/300 (2)
 (300 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,00-3,10 mm (from BDC)
 (2,95-3,15)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery (1) cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery (2) cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	12,1 (+0,1)	14,6 - 14,8	0,4(0,8)		15,6 - 15,8	
250	6,8-7,0	0,9 - 1,5	0,4(0,7)	6,8-7,0	0,9 - 1,5	
800/700/500	-	C 4 - 5	0,5(1,0)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQV... 373DR (1)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel (1)	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1100 1400	15,2-17,8 0 - 1	-	-	-	ca. 16	100 250 520-580 700	min. 8,5 6,8-7,0 = 2,0 0 - 1	250 1100	0,6-1,6 8,3
ca. 66	11,1 4,0	1140-1150 1280-1310				3a			1100 850 700	+0,1 12,1 12,4 12,8

Torque control travel a = - mm Sp. 10-11 -

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2)		Rotational speed (2b) limitation intermediate speed 4a	Fuel delivery characteristics (5a) high idle speed (5b)		Starting fuel delivery idle switching point (6)		Torque-control (5) travel Control rod travel mm	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
LDA 1100	0,7 bar 146,0-148,0 (143,0-151,0)	1140-1150*	LDA 700	0,7 bar 157,0-161,0	100	215 - 235		
			LDA 500	0,2 bar 123,0-127,0	250	11,0 - 17,0		
			LDA 500	0 bar 111,0-113,0		100-170 (80-190)		./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

8.77

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B. Governor Settings

RQV.. 276DR (2)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 50	1100 1400	15,2-17,8 0 - 1	-	-	-	ca. 13	100 250 325-365 500	min. 7,5 5,9-6,1 =2,0 0 - 1	200 600 1140	0,5-1,2 3,8-4,1 8,3
						(3a)				

Torque control travel a = - mm see col. 10-11 -

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point	Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	9
1100	156,0-158,0 (153,0-161,0)	1140-1150*	800 500	166,5-170,5 (163,5-173,5) 165,0-169,0 (162,0-172,0)	100 250	125 - 145 11,0-17,0	

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel
	Gauge pressure = bar	Gauge pressure = bar	mm
295 / 373DR 345	0,68	0,32 0,18 0	12,8 - 12,9 12,3 - 12,4 11,3 - 11,5 10,9 - 11,0

En